

## **4 WATER QUALITY**

### **4.1 Regional Water Quality**

The aquifers discussed in Section 3 are regional systems that are briefly described below. Aquifers from local perched systems to the Gage aquifer are susceptible to contamination from various surficial activities including industrial releases and non-point source irrigation. These aquifers have highly variable water quality, show season trends, tend not to support long-term production and are not used for water supply purposes.

Deeper aquifers including the Lynwood and Silverado are the primary sources of water in the basin. In general, water in these aquifers contains quality water that is low in total dissolved solids. These aquifers are actively managed to store ground water supplies for the basin. Over pumping prior to the 1960s caused salt-water intrusion into the Lynwood and Silverado aquifers. A hydraulic barrier (section 3.1.2) prevents further intrusion of salt water, but salt water trapped in the aquifers has degraded the quality of the water by raising total dissolved solids content. This salt-water plume may eventually impact water in aquifers beneath the Site.

### **4.2 Site Vicinity Water Quality**

There are a number of dissolved-phase VOC plumes in aquifers in the Site vicinity and several areas in which free-phase LNAPL and DNAPL are known or suspected to occur. Sheets 7, 8, 9 and 10 illustrate the distribution of TCE, 1,1-DCE, PCE, and chloroform, respectively. Sheet 11 illustrates the general distribution of the main chlorobenzene, benzene, and pCBSA plumes. These plumes are contaminants that are not wide spread at the Site but are derived from adjacent sites. The distribution of known and suspected LNAPL and DNAPL areas is also shown on Sheet 11. A generalized cross-sectional view of the affected aquifers showing the approximate locations of plumes is provided on Sheet 12.

The following observations are made regarding the distribution of contaminant plumes in the Site vicinity:

- Dissolved-phase plume(s) originating at the former ILM site are generally upgradient of the Site and consist primarily of PCE. This PCE plume appears to have impacted groundwater beneath Site parcel B, and possibly parcels C and D.
- Dissolved-phase plumes originating from the Montrose site include chlorobenzene, benzene, chloroform and pCBSA. The plumes have impacted groundwater beneath parcel D and parcel B. DNAPL from sources at the Montrose site also appears to be present at parcel D. These contaminant sources are in close proximity to the downgradient portions of VOC plumes that originate at the Site.
- Dissolved-phase plumes originating from the former Del Amo site include consist largely of benzene but also include some PCE, TCE and limited 1,1-DCE. These plumes are downgradient of and generally some distance from the Site. There is a remote chance that PCE and TCE from a source at the western edge of the former Del Amo site (near well PLZ016) may have impacted groundwater at the eastern edge of the Site. Areas of known or suspected LNAPL and DNAPL are some distance from VOC plumes that originate at the Site.

General water quality as described by the major anions and cations is also illustrated in Piper diagrams developed for the Del Amo Study Area; copies of these are included in Appendix C

### **4.3 Site Water Quality**

Water quality sampling has been performed at the Site over a longer period (March 1987 to the present) and is has been more frequent than sampling at the adjacent sites (Table 2-1). Tables 4-1 and 4-2 summarize the results of testing at the Site for 'major' and 'minor' constituents.

Sheets 7 through 10 illustrate the distribution of plumes that originate at the Site. Figures 4-1 through 4-4 are portions of Sheets 7 through 10 that cover the Site and the adjacent ILM site. There may be as many as three discrete source areas at the Site. The following observations are made regarding the dissolved-phase VOC plumes at the Site:

- The largest and best-documented plume is located in the northwest corner of Building 36. The plume consists largely of TCE and 1,1-DCE with lesser amounts of chloroform. The Building 36 plume does not appear to include PCE. Data for this plume have been collected since early 1987.
- A second plume has been detected in the vicinity of well TMW-3. The TMW-3 plume contains TCE and 1,1-DCE but does not appear to contain either PCE or chloroform.
- The potential third plume is suggested in the area of well TMW-12. Water at TMW-12 contains TCE, 1,1-DCE and chloroform; PCE does not appear to be present. The potential exists for groundwater impacts at TMW-12 from sources on the Montrose site. The relative contributions of the Site and the Montrose site to groundwater at TMW-12 are not clear.

Time-series graphs of selected VOC concentrations at individual wells are presented in Figures 4-5 through 4-18. These graphs illustrate VOC changes through time and the relative concentrations of major and minor VOCs at individual wells. Major VOCs (blue lines) are plotted against the left-hand, logarithmic axis and minor VOCs (green lines) are plotted against right-hand, linear axis.